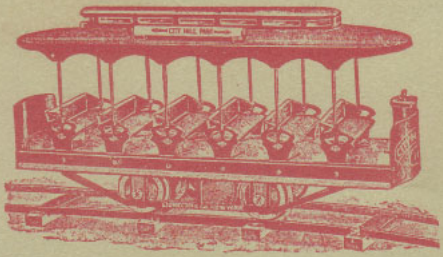
MINIATURE
ELECTRIC
CARS

With full accessories for

WINDOW DISPLAY

and

HOLIDAY GIFTS.



Manufactured by

Lionel Manufacturing Co.

Incorporated,

24 and 26 MURRAY STREET,

NEW YORK.

These Goods are
For Sale by

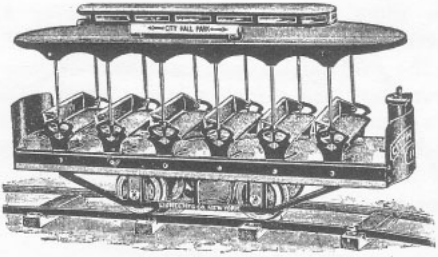
INTRODUCTION.

The goods described herein are offered for sale to the general public for the second year, although they have been in use for a long time by mechanical institutions for demonstrating purposes, as they give a thorough insight into the workings of the electric cars now so universally used. We received so many inquiries from the students and their friends for duplicate outfits that we decided to manufacture them in larger quantities, thereby reducing their cost and enabling us to offer them at a popular price.

We have on file a large number of letters of recommendation from parties who have used them heretofore, and as our 1902 outfit is superior to any we have yet turned out, it is safe to assume that they are all we claim for them.

Our goods should not be conflicted with any other on the market—they are in a class by themselves. They are so substantially constructed that they may be used from year to year. All parts are interchangeable, and, as we are continually adding new features, a wholly equipped miniature road may be built from time to time.

ELECTRIC TROLLEY CAR.



(Catalogue No. 300.)

(Actual size, 16½ inches long; weight, packed, 12 pounds.)

By reference to the above cut it will be noticed that these cars are built on the lines of the regular electric trolley cars. Every feature is carried out to the minutest detail. A full description of the parts follow:

The CAR BODY is constructed of cold-rolled steel, and is 16½ inches long. It has 6 seats, all of which are reversible, as are the signs at the top. It is finely enameled and lettered.

The CONTROLLER in front, which starts, stops and reverses the car, is an exact reproduction of those ordinarily used on large cars. It is cast of brass and nicely finished.

The MOTOR is designed to attain high speed and hauling power, and at the same

time consume a minimum amount of current. The armature is laminated and drum wound. To those conversant with electricity the merits of this will be readily appreciated.

The WHEELS are stamped of heavy brass, and are 2 inches in diameter. They are superior to cast-iron wheels commonly used, as they conduct the current much better from the tracks, and have a smooth surface to ride over the rails.

The SPRING BEARINGS are one of the principal features of the trucks. They take up any variation in the track, which prevents the car leaving the rails, no matter at what speed it may be going.

The GEARS in this outfit are all machine cut; they will not break or wear out. They are perfectly adjusted, and work noiselessly. Friction is reduced to a minimum.

The SIDE and CROSS BRACES which hold the mechanism in place are cast iron. They are very rigid, and will withstand more than the ordinary amount of wear and tear.

The Rails are made of ⅜-inch steel, and are cut in sections, so that any shaped track may be formed.

The Ties are grooved to admit the insertion of the rails. The rails are 2⅞ inches apart.

The Axles are made of 3-16-inch steel rod.

The Bearings are made of turned brass.

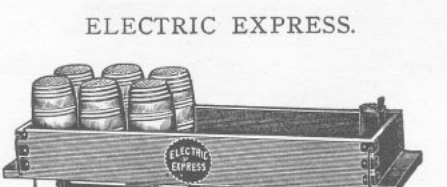
As many of our patrons use batteries of their own construction, or purchase those which they consider the best for the work, we sell the outfit without battery, unless

otherwise ordered. Any battery showing 6 volts will do the work. Battery talk follows:

This outfit consists of the car, 30 feet of rail and 48 ties, which will make a rigid track.

Price complete, boxed..... $6.00
Duplicate sets of track..... 1.50

ELECTRIC EXPRESS.



(Catalogue No. 200.)

(Actual size, 17½ inches long.)

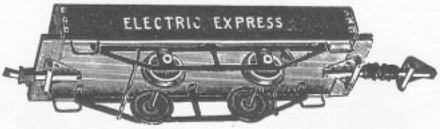
This car has the same mechanism in every respect as the car described before.

As a toy it will afford the user much greater pleasure than the trolley car, as it may be loaded and unloaded. Six miniature barrels are supplied with each outfit.

The car body is built of hard wood, is 17½ inches long and 4½ inches wide. It is red enameled and lettered in gold. It has hand-rails and steps, as well as corner plates, made of brass.

Price of outfit complete, with 30 feet of rail and 48 ties..... $6.00

ELECTRIC EXPRESS TRAIL CAR.



(Catalogue No. 400.)

(Actual size, 17½ inches long.)

The body of this car is the same as the No. 200. It is a duplicate in every other respect except that the motor and other mechanical parts are omitted. It is fitted with couplers, so that it may be attached to the No. 200. These cars coupled together make a very interesting and entertaining outfit.

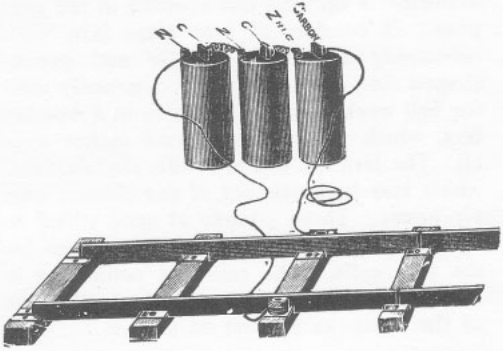
Price of car complete, with couplers... $2.25

ABOUT BATTERIES.

(Catalogue No. 301.)

We have found it advisable when making up outfits complete with battery, to supply four dry cells, which work satisfactorily when used intermittently for from ten to fifteen hours; allowing the battery to rest is very beneficial to them as it prolongs their usefulness.

Price of four dry cells, with wire and full directions for connecting, $1.20.



This illustrates the proper way to connect battery to track.

OUR PLUNGE BATTERY.

(Catalogue No. 302.)

In selecting a suitable battery for continuous work to operate our outfits a number of difficulties had to be contended with, namely, weight, bulk, cost and cleanliness.

Our plunge battery, which we describe herewith, is the best one adapted to the purpose. It consists of four glass jars, each containing a carbon cylinder and pencil-shaped zinc, similar to those commonly used for bell work. They are put up in a wooden box, which measures 9 x 12 x 8 inches over all. The jars are charged with electric sand, which may be purchased of any electric supply house. Three pounds of sand added to three quarts of water make a full charge for the four cells. The cells are connected in series—that is, the carbon of one to the zinc of the other, as per cut on page 7.

When battery is not in use the zincs should be lifted from the solution and the deposit on them wiped off with a wet cloth. If they are allowed to remain in the solution they will be consumed.

The jars must not touch; they should be kept apart.

Price of complete battery, with full charge (Catalogue No. 302).....	$2.50
Price of carbon cylinders, each (Catalogue No. 303).....	.25
Price of composite zincs, each (Catalogue No. 304).....	.07
Price of electric sand, 3-pound can (Catalogue No. 305).....	.50
Price of glass jars, each (Catalogue No. 306).....	.12½

CAUTION.

When battery is connected to the track no metal whatsoever should be placed across the rails.

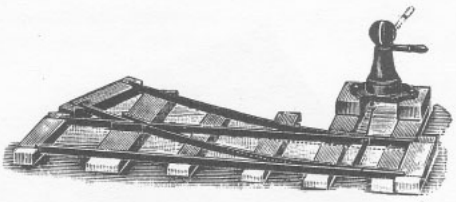
THE TRACK.

(Catalogue No. 310.)

The rails are cut in two lengths. To form a straight track they should be used in pairs. To form a curve one of the shorter rails is used on the inside and the longer one on the outside, as per sketch above. A complete circle may also be formed, but it is not prudent to do so, as the continual friction on the wheels rounding the curve consumes a great deal more battery current than when car is run straight or slightly curved.

The ties with the brass plates should be used where the rails meet. Three ties without the plates should be spaced equally between them.

SWITCH AND SIGNAL.



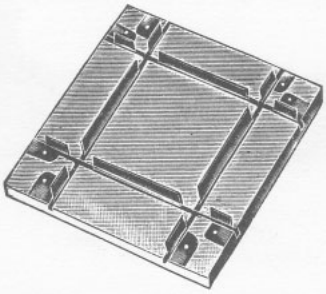
(Catalogue No. 320.)

(Actual size, 17½ x 8 x 4½ inches.)

This auxiliary to the road is very desirable. Its mechanical construction is perfect. All parts work on spring bearings. The lever which shifts the track changes the signal at the same time. The signal discs are red and white enameled. The switch is 17½ inches long, 8 inches wide and 4½ inches high. It is put in connection with the track the same as any of the sections. All electrical contacts are permanent. The signal is cast iron and neatly finished.

Price, boxed..... $1.50

CROSSING.



(Catalogue No. 330.)

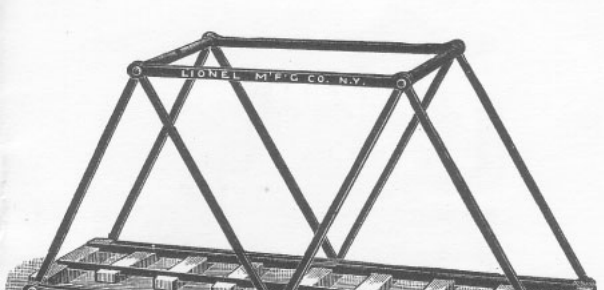
(Actual size, 6 inches square.)

Constructed as neatly and substantially as the other parts of the outfit. Connects with the track same as any of the other sections. The cross-rails are mounted on a base 6 inches square. The electrical connections are permanent.

With this arrangement the track may be made into a number of different forms, and if a well-equipped road is desired this part is indispensable.

Price, complete..... $0.50

SUSPENSION BRIDGE.



(Catalogue No. 340.)

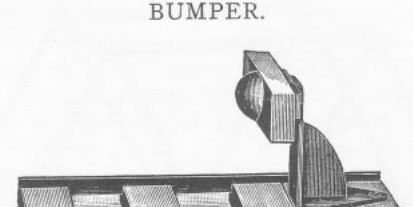
(Actual size, 2 feet long, 10 inches high.)

This bridge is an exact reproduction of the suspension railroad bridges to be found all over the country. It is 2 feet in length and 11 inches high. The braces which form this bridge are all apart, so that the user may have the advantage of setting it up. Each brace is numbered, so that no error can be made.

This accessory adds to the attractiveness of the road. It may be elevated to any height by placing some of the ties underneath it.

Price complete, boxed..... $1.50

BUMPER.



(Catalogue No. 350.)

(Actual size, 4 x 4 x 3 inches.)

This arrangement is essential at any terminal of the road, as it prevents the car leaving the track. It is solidly constructed, and modeled after the large ones commonly used.

The tie supplied with the bumper should be inserted between the joints of the last two sections of the track instead of a tie with a brass plate. This cuts off the current before the car strikes the bumper, and lessens the impact.

Price, packed..... $0.50

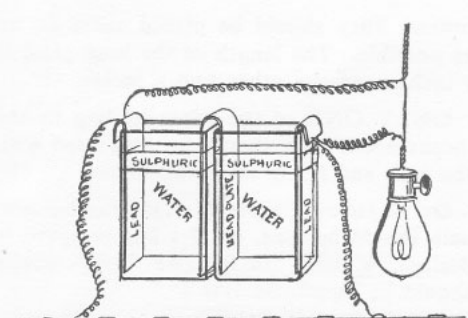


Diagram showing the proper way to operate our cars when utilizing direct electric current.

(Catalogue No. 370.)

The outfit supplied by us consists of two glass jars 2 x 1¼ x 3½ inches, and plates of lead 1 inch wide and 1-16 inch thick.

The cells are filled with water to the first line from the bottom, and a sufficient amount of sulphuric acid is added to bring it up to the second mark. NEVER ADD WATER TO THE ACID IN ANY EVENT, BUT POUR THE ACID ON TOP OF THE WATER.

The glass jars are placed together, and the U-shaped lead plate and the shorter ones with the posts on them are inserted as shown above. The plates must not touch each

other. They should be placed apart as far as possible. The length of the long plate is 7 inches and the other two 4 inches.

ONLY ONE of the wires leading to the incandescent bulb should be connected with the cells and track, as shown above.

On a 110-volt current a 32-candle-power bulb should be used, or, if a higher speed is desired, a lamp of greater candle-power should be employed.

Price of jars and plates.....50 cents.

This apparatus may be constructed by anyone, using material as near as possible to that described, and mixing the solution in the proportion of ten parts of water to one part of sulphuric acid by volume.

When the car ceases to operate, the solution in the jars should be renewed.